



## Advice for the Home Team Toolbox by Dr. Debi Warner

Dear Dr. Debi,

People tell me we lose a lot of energy, shown by snow melting in spots on the roof and our ice dams. We also have some pretty cold rooms. We did the usual method of fiberglass insulation with R=15 everywhere. What does R do?

Why is the place drafty and cold anyway? I am confused. Signed, Drafty House

Dear Wannabe Warmer

The insulation value of R refers to the resistance to heat flow of the material under optimal conditions. Actually, it takes a bit of learning to absorb the concepts of heat loss prevention today. We cannot just grab an R-value a figure it tells the whole story. Slowing down before we jump into the job, to gather the latest info will actually help make the house be more comfortable and cheaper to heat.

Nowadays, there is a revolution in the energy efficiency of houses. Some time ago, we went through a counter culture in the 70s when super-insulation and tight houses were a fad, but then had terrible moisture and mold problems and sick buildings. In reaction, the industry returned to the “breathing house” standard that accepted seeping losses as a positive factor in the air exchange of the house. Now, with energy costs so high, the industry has ramped up its materials and techniques to hold onto heat and also have a healthy house.

Basically it is now expected to seal exterior walls so that air does not flow out through cracks. When there is air leakage, it tends to use the fiberglass as a filter, rather than a heat retainer, and your R-value will be a pretty number rather than a measure of energy retention.

We need to allow our brains to roll back into science class and think through the different sorts of forces on the energy system of the house. If you are not ready, then get some coffee first, but get into it, or lose a lot of money out the window.

One type of energy transfer is conduction. That is the touching transfer of heat energy. If you have a metal brace that bridges the interior of the house and goes through the wall to the outside, it will transfer the heat energy from inside to outside. This can be a metal door or window jam, or a bolt for a satellite bracket, and on a smaller scale, long nails and hardware. Many window

manufacturers today make sure their products insulate the jam and reduce highly conductive materials in those places, so that they do not add conduction bridges to the wall.

Wall studs are somewhat conductive, with an R-value of about 7 for a 2x6 stud. We will try to counteract that in other efforts to preserve energy in the wall. You want an over R for the wall of 18, so you have a ways to go.

You will want to minimize the effects of convective heat loss that is the flow of air and the sailing losses that come with a draft or leak in the wall or roof. You will know if you have air flow problems in your walls or attic (which needs R= 49 by the way) if you get to look at the fiberglass and it is dirty. If it is black or grey, it shows that it has been filtering house air and collecting the dust, rather than resisting heat flow. Any places it is dark, you ought to pull it back and seal the cracks so that it will do its job right. Most folks would replace the insulation, as all that dust may contain icky things you would rather not have hanging around, like dust mites, and also will compromise the insulating qualities of the fiberglass.

You also want to eliminate the many cracks that develop in an old house at the joints of walls and ceilings, and around receptacles and windows.

Now the other factor in heat loss is radiant loss. That is the glowing type of energy you notice in front of a wood stove, quartz heater, or the sun. Most materials you buy show R-values pertaining to this type of loss, hoping and expecting to be used under optimal conditions where the other types of energy transfer are minimal. Low-E glass and new storm doors have modern expectations of energy retention that are superior to the traditional lovely old doors and windows.

You will want to review your overall plan with some experienced folks. As you may get closer to a tight house, you will need to manage the moisture and healthy heated clean air, with a heat exchanging ventilation system. These are extraordinarily efficient and low cost to run, and make a great difference in the comfort and health of the home.

So, a little science and a little study, and a lot of caulk, foam and attention to tune up your insulation system will bring your house into a more cozy and energy efficient home.

Happy Home Team!

Dr. Debi

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*Dr. Debi Warner is the Founder of Renovation Psychology® radio host, and author of the book, Putting the Home Team to Work, available now online at RenovationPsychology.com. Dr. Debi provides advice for greater domestic harmony to folks who are renovating their home – for True Home Improvement. This column is offered for enjoyment and enhancement and is not intended to replace your personal medical care. Photo by Bob Jenks, St. Johnsbury, Vt.*

*Dr. Debi has a consultation practice, from her studio in Littleton, NH, with house calls all over the East coast.*

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